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Transmitted herewith for filing is the patent application of

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For: GUI SCREEN GENERATING APPARATUS,  
GUI SCREEN GENERATING METHOD AND  
STORAGE MEDIUM RECORDING GUI SCREEN  
GENERATING PROGRAM

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( ) sheet(s) of informal drawing(s).  
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Fee Calculation For Claims As Filed

a) Basic Fee	\$ 690.00
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APPLICATION FOR

UNITED STATES LETTERS PATENT

SPECIFICATION

Inventor(s): Takao CHIHARA and Toshihiko SUGIMOTO

Title of the Invention: GUI SCREEN GENERATING APPARATUS,  
GUI SCREEN GENERATING METHOD AND  
STORAGE MEDIUM RECORDING GUI  
SCREEN GENERATING PROGRAM

**GUI SCREEN GENERATING APPARATUS, GUI SCREEN GENERATING  
METHOD AND STORAGE MEDIUM RECORDING GUI SCREEN  
GENERATING PROGRAM**

**5      Background of the Invention**

**Field of the Invention**

The present invention relates to an apparatus generating a graphical user interface (GUI) screen based on the screen data of a character-based user interface screen, a method generating a GUI screen and a storage medium recording a GUI screen generating program.

**Description of the Related Art**

With the increasing speed and decreasing cost of personal computers and a request on a client-server type operation form, it is requested to convert an existing host-centered process user interface to a client-server type graphical user interface.

It is necessary to determine the name of a control laid out on a GUI screen in order to convert a host-centered type character-based user interface (hereinafter called "CUI") screen to a graphical user interface (hereinafter called "GUI") screen. However, since a name used to specify a field is not defined

in the screen data of a CUI screen, it is necessary to specify a control name corresponding to each field of the CUI screen.

5      **Summary of the Invention**

When a control name was specified, conventionally a control name was mechanically determined regardless of the contents of individual output and input/output fields. Therefore, the control name could not be guessed from the purpose for use or for utilization and thereby a programmer had to expend a lot of time and energy when he/she performed the maintenance of a generated GUI screen. Since the control name was mechanically determined, there was a possibility that a similar name may be assigned and thereby an error easily occurred at the time of programming. In order to change the assigned control name to a name easily identified by a business developer, a GUI screen generated by the business developer had to be edited using a GUI screen editing tool and the editing work was troublesome.

An object of the present invention is to make it possible to specify controls in such a way that a control laid out on a GUI screen can be easily identified.

The GUI screen generating apparatus of the present invention comprises an extraction unit extracting field information from the screen data of a character-based user interface screen and a naming unit naming a control on a graphical user interface screen corresponding to the field information according to the field information extracted by the extraction unit.

According to this invention, when a character-based user interface screen is converted to a graphical user interface screen, a control on the graphical user interface is named according to the field information of the character-based interface screen. Therefore, the correspondence between the field information of a CUI and the control name of a GUI can be easily understood and thereby both the editing work efficiency of a program and the correction work efficiency of the edited program are improved.

20

#### **Brief Description of the Drawings**

Fig. 1 shows the basic configuration of a preferred embodiment.

Fig. 2 shows the system configuration of the preferred embodiment.

Fig. 3 is a flowchart showing the operation of a GUI screen production unit.

Fig. 4 shows both the structure of screen data and the structure of field information.

5 Fig. 5 shows an example of a name regulation definition table.

Fig. 6 is a flowchart showing the same name checking process.

Fig. 7 shows the layout of a CUI screen.

10 Figs. 8A and 8B show both the layout of a GUI screen and the classes of the controls.

Fig. 9 shows the processes of a GUI screen production unit 15.

15 Fig. 10 shows an example of the screen data of a CUI screen.

Fig. 11 shows the classes and names of controls laid out on a GUI screen.

Fig. 12 shows an example display of a CUI screen.

20 Fig. 13 shows a display state in the case where an item is extracted from a CUI screen.

Fig. 14 shows titles extracted from the screen data of a CUI screen.

Fig. 15 shows a display state in the case where a GUI screen is generated.

25 Fig. 16 shows a generated GUI screen.

Fig. 17 shows storage media.

#### Description of the Preferred Embodiment

The preferred embodiment of the present invention  
5 is described below with reference to the drawings.  
First, the basic configuration of the GUI screen  
generating apparatus in a preferred embodiment of the  
present invention is described with reference to Fig.  
1.

10 In Fig. 1, the extraction unit 1 extracts field  
information from the screen data of a character-based  
user interface screen. The naming unit 2 specifies the  
control name of a graphical user interface screen  
according to the field information extracted from the  
15 extraction unit 1.

Since the control name of a graphical user  
interface (GUI) screen are specified according to the  
field information of a character-based user interface  
(CUI), the correspondence between the field of a CUI  
20 screen and the control name of a GUI screen can be  
easily understood and a program to convert the CUI  
screen to a GUI screen can be easily prepared. The  
program can be easily maintained.

The naming unit 2, for example, analyzes field  
25 information, and if the class of the field information

is an input/output field, the control name of the GUI screen is specified based on the field character string of an output field in the vicinity of the input/output field.

5       In this way, the control name is specified in relation to the content of the input/output field. Therefore, when a program is generated or when the program is corrected, the nature of the control can be understood and the generation and correction of a  
10      program can be efficiently performed.

Fig. 2 shows the system configuration of the host-centered type system in a preferred embodiment of the present invention.

15      In the system of the preferred embodiment, a host machine (hereinafter called a "host") 11 is connected with a plurality of client machines (for example, personal computers, etc.) 12 via a LAN 13.

The client machine (hereinafter called a "client") 12 comprises an emulator 14 storing the  
20      screen data of a character-based user interface (hereinafter called a "CUI") screen which are transmitted from the host 11, and a GUI screen production unit (GUI screen generating apparatus) 15 converting the screen data of a GUI screen to the  
25      screen data of the CUI screen stored in the emulator

14. In this preferred embodiment, the client 12 is composed, for example, of a personal computer, etc. The emulator 14 and GUI screen production unit 15 are realized as a program for a development tool used in  
5 the client 12.

The GUI screen generation unit 15 includes a CUI screen analysis unit 16 analyzing the field information of the screen data of a CUI, a control generation unit 17 specifying the control name of a  
10 GUI screen according to a name regulation definition table 18, etc., and a control layout unit 19 determining the layout of controls on the GUI screen.

Furthermore, a display unit 20 displaying the screen data of a generated GUI is connected to the  
15 client 12.

Next, the operation of the GUI screen generation unit 15 with such a configuration, is described with reference to the flowchart shown in Fig. 3.

The GUI screen generation unit 15 acquires field  
20 information from the screen data of the CUI stored in the emulator 14 (S11 shown in Fig. 3). Furthermore, the screen generation unit 15 acquires the field character string of the field information as a control name candidate (S12).

25 The screen data of a CUI screen are composed of

a plurality of pieces of field information, as shown in Fig. 4, and each piece of the field information is composed of information indicating whether the field is an output field or input/output field, field 5 attribute information consisting of field length information, a data type to be displayed or inputted, etc., and a field character string.

Returning to Fig. 3, the screen generation unit 15 judges whether the field is an output field or 10 input/output field, from the field attribute of the acquired field (S13).

If the attribute of the field is an input/output field, the field character string of an output field which exists before the input/output field and closest 15 to the input/output field is designated as the control name candidate (S14).

If the attribute of the field is an output field, the field character string is designated as the control name (S15).

Then, the screen generation unit 15 references 20 the name regulation definition table 18 and checks whether the control name candidate satisfies the name regulations of the name regulation definition table 18 (S16).

The name regulation definition table 18 defines 25

characters which are permitted for use as a control name, and for example, the kinds of permitted characters are defined for each of a leading character, an middle character and a last character,  
5 as shown in Fig. 5.

If a control name candidate acquired from a field character string is assumed to be "ADDRESS BOOK", as shown in Fig. 5, the leading character is "A", whereas a leading character defined in the name regulation definition table 18 shown in Fig. 5 is "English only".  
10 Therefore, the leading character satisfies the name regulation. The middle character of the candidate consists of "English and a blank", whereas the name of a middle character defined in the name regulation definition table 18 is "English, digit or hyphen".  
15 Therefore, the middle character of the candidate does not satisfy the name regulations. "Blank" in the control name is deleted accordingly. Furthermore, the last character of the control name is "K", whereas the last character defined in the name regulation definition table 18 is "English or digit". Therefore,  
20 the last character satisfies the name regulations.  
25

As a result of the above-described name regulation check, for example, "ADDRESSBOOK" obtained by deleting "blank" from the control name candidate

"ADDRESS BOOK" is selected as a new candidate for the control name.

Returning to Fig. 3, after completing the name regulation check in step S16, the screen generation unit 15 proceeds to the same name check in step S17.

Fig. 6 is a flowchart showing the same name check process. First, the GUI screen generation unit 15 sequentially retrieves data from a control name table 21 registering assigned control names and judges whether the same name as the control name candidate is registered (S21 shown in Fig. 6).

The control name table 21 registers the names of controls already laid out on a GUI screen. In this preferred embodiment, "ADDRESSBOOK", "NAME-TITLE", etc., are registered as assigned control names, as shown in Fig. 6.

If the same name as the name candidate is registered in the control name table 21, a specific character string (including a numeral and a serial number) is added to the name candidate or assigned control name in order to prevent double naming (S22).

If the same name as the name candidate is not registered in the control name table 21, the name candidate is adopted as the control name of the field (S23). Furthermore, the adopted control name is

registered in the control name table 21 (S24).

By the above-described process, the name obtained by adding a specific character string to the character string of an output field in the vicinity of the  
5 input/output field of a CUI screen or the character string itself, is set as the control name. Therefore, from the control name it can be judged which field the data often output or input/output field is related to . Therefore, a program can be easily corrected and  
10 mistakes in programming can be reduced.

Next, Fig. 9 shows the process of the GUI screen generation unit 15 in the case where the GUI screen shown in Fig. 8 is converted from the CUI screen shown in Fig. 7.

15 The application program of the host 11 performs a picture display instruction and transmits the screen data of a CUI screen to the client 12. The emulator 14 of the client 12 stores the screen data of the CUI screen.

20 The screen data acquisition unit 31 of the GUI screen generation unit 15 fetches the screen data of the CUI screen of the emulator 14. Then, a field information read unit 32 reads field information from the screen data. At this time, if there is no field  
25 information to be read, the flow exits the loop and

proceeds to the termination process of the GUI screen generation.

Fig. 10 shows example screen data of a CUI screen. For example, as to the first piece of field information 1, the field state is output, that is, the field is a display field, the character length is 11 characters and no field string is set. Therefore, nothing is displayed in the corresponding position of the CUI screen.

10 As for the second piece of field information 2, the field state is output, the character type is English or numeral, the character color is "yellow", the background color is "black" and the field character string is "ADDRESS BOOK". Therefore, a  
15 character string "ADDRESS BOOK" is displayed in the corresponding position of the CUI screen.

As for the fourth piece of field information 4, the field state is output, the field length is four characters, the character type is English or numeral,  
20 the character color is green, the background color is black and the field character string is "NAME". Therefore, a character string "NAME" is displayed in the corresponding position of the CUI screen.

As for the fifth piece of field information 5,  
25 the field state is output, the field length is five

characters, the character type is English or numeral and no field character string is set. Therefore, nothing is displayed in the corresponding position of the CUI screen.

5 Furthermore, as for the sixth piece of field information 6, the field state is input/output, that is, the field is an field which can be inputted and displayed, the field length is 15 characters, the character type is English or numeral, the character color is white, the background color is black and the field character string is "XXX...XX". Therefore, a character string "XXX...XX" is displayed in the corresponding position of the CUI screen.

10 To generate a GUI screen, first, a CUI screen as shown in Fig. 7 is displayed. On the CUI screen, for example, a field character string "NAME" is displayed in the corresponding position of the field information 4 shown in Fig. 10. Since no field character string is set, a blank equivalent to five characters of the field length is displayed in the field information 5. As for the field information 6, the field is an input/output field and a character string "XXX...XX" is set as a field character string. Therefore, the character string is displayed. Similarly, each display 15 20 25 is performed according to each piece of field

information of the screen data, and the CUI screen shown in Fig. 7 is displayed based on the screen data shown in Fig. 10.

After field information is read, the class determination unit 34 shown in Fig. 9 judges whether the field is an output field or input/output field, from the field state of the field information and determines the class of the control. Specifically, the class determination unit 34 judges whether the control is static or edit.

Furthermore, a name determination unit 33 determines the control name candidate based on both the field state and field character string. For example, if the field is an output field, the name determination unit 33 selects the field character string as the control name candidate. If the field is an input/output field, the name determination unit 33 selects the field character string of an output field which exists before and closest to a field to be specified, as the control name candidate. At that time, a specific character string is added to an already assigned control name or a newly assigned control name so as to prevent the control name from being the same as the control name of the output field of the naming source. An output field which exists

closest to a field to be named means an output field which is found in the first place when the lines of the field are retrieved leftward and the columns are retrieved upward.

5       Fig. 11 shows the classes and names of controls to be generated by both the above-described name determination unit 33 and class determination unit 34.

As to the field information 2, the field state is output, as seen in Fig. 10. Therefore, static is  
10      set as the control class of a control corresponding to the field information 2. Although the field character of the field information 2 is "ADDRESS BOOK", "blank" between characters is not permitted by the name regulations. Therefore, a character string  
15      "ADDRESSBOOK" obtained by deleting "blank" is set as the control name.

Then, as for the field information 4, the field state is also output. Therefore, static is set as the control class and a field character string "NAME" is  
20      set as the control name.

Then, as for the field information 6, the field state is input/output. Therefore, edit is set as the control class. Since no field character string is set in the field information 6, and the field character string "NAME" of the output field which exists closest  
25

to the field is selected as the control name candidate of the field. When a character string "NAME" is selected as the control name candidate of the field information 6, the above-described control name table 5 21 is referenced and it is checked whether the control name is already registered there. In this example, since the control name "NAME" is already registered in the control name table 21 as the control name of the field information 4, the control name of the field 10 information 4 is modified by adding a specific character string, for example, a character string "-TITLE" to the control name of the field information 4. In this way, the control name of the field information 4 is modified to "NAME-TITLE", and "NAME" 15 is set as the control name of the field information 6. Therefore, the input/output field and the output field in the vicinity of the input/output field are prevented from having the same control name.

As for the field information 10, the field state 20 is also input/output. Therefore, edit is set as the control class, and the character string "ADDRESS" of the output field which exists closest to the field is selected as the control name candidate of the field. At this time, since the control name "ADDRESS" is 25 already registered in the control name table 21 as the

field of field information 8, a specific character string "-TITLE" is added to the control name "ADDRESS" of the field information 8 to prevent double naming, and a character string "ADDRESS-TITLE" is set as the 5 control name of the field information 8. Since in this way, double naming of the control name is prevented, a character string "ADDRESS" is set as the control name of the field information 10.

Then, as for field information 12, the field state is input/output. Therefore, edit is set as the control class. Furthermore, since the field is an input/output field, the field character string "ADDRESS" of the output field which exists closest to the field is selected as the control name candidate. 10  
15 At this time, since a character string "ADDRESS" is already registered in the control name table 21 as the control name of the field information 10, the control name of the field information 10 is modified to "ADDRESS1" by adding a serial number to the control name of the field information 10, and simultaneously "ADDRESS2" is set as the control name of the field information 12.  
20  
25

Similarly, "TEL-TITLE" is set as the control name of field information 14, of which the field is an output field, and "TEL" is set as the control name of

the corresponding input/output field. Although the field character string of the field information 14 is "TEL.", "TEL" obtained by deleting "." or "TEL-TITLE" is set as the control name since a period "." is not permitted by the name regulations.

5 Then, the position determination unit 35 shown in Fig. 9 calculates the line and column positions based on the field length in the field information and converts the positions into the coordinates on the GUI 10 screen.

Lastly, a layout determination unit 36 layouts controls on the GUI screen based on the control name determined by the name determination unit 33, the control class determined by the class determination 15 unit 34 and the coordinates determined by the position determination unit 35.

The above-described processes are performed until all the screen data of the CUI screen are read, and when all the screen data are read, the termination 20 process is performed.

By the above-described processes, the GUI screen shown in Fig. 8A can be converted from the CUI screen shown in Fig. 7. Fig. 8B shows the classes of controls laid out on the GUI screen. The class of a control for 25 displaying a character string, such as "NAME",

"ADDRESS", etc., is static, and the control class of an input/output field is edit.

Next, the procedures in the case where a GUI screen is converted from a CUI screen for inputting  
5 an address, name, birthday, etc., described above are described below with reference to Figs. 12 through 16.

First, a development tool for generating a GUI screen is started, and the CUI screen for address input shown in Fig. 12 is displayed.

10 Then, if the "item extraction" of "communication record" is selected from a pull-down menu, as shown in Fig. 13, a title corresponding to each field of the CUI screen is generated, as shown in Fig. 14.

15 Of the data shown in Fig. 14, an item with a check mark in the field of "communication target" is an item for which data are transmitted and received between the emulator 14 and the GUI screen control of a client 12, and an item with a check mark in an attribute field is a field for which data about  
20 attributes (such as color, input/output state, etc.) are transmitted and received between the emulator 14 and the GUI screen control of the client 12.

Since, as seen from the screen data of the CUI screen shown in Fig. 10, the first field is an output  
25 field and a field character string is not set in the

field. "TITLE1" is automatically set as the title. Since the second field is an output field and "ADDRESS" is set as a field character string, the field character string "ADDRESS" is set as the title.

5       Since the fourth field is an output field and "NAME" is set as a field character string, the field character string "NAME" is set as the title.

10      Since the sixth field is an input/output field, the field character string "NAME" of the third field, which is an output field existing closest to the input/output field is set as the title. The title of the third field is modified from "NAME" to "NAME-TITLE" accordingly.

15      As described above, data of titles, lines, columns, etc., as shown in Fig. 14 are generated based on the screen data of a CUI screen.

20      Then, if "screen generation" of "communication record" is selected from the pull-down menu, as shown in Fig. 15, a GUI screen as shown in Fig. 16 is generated based on the data shown in Fig. 15. In this example, each field character string of the output field shown in Fig. 14 is displayed on the GUI screen, and the input field of each piece of data is displayed. Furthermore, the control names of the 25 automatically generated output fields and input/output

fields are displayed in the field of control list.

Specifically, "ADDRESSBOOK" obtained by deleting  
a blank according to the name regulation is set as the  
control name of an output field, in which the field  
5 character string of the CUI screen is "ADDRESS BOOK"  
with a blank.

"NAME", which is the field character string of  
an output field existing closest to the input/output  
field is set as the control name of the name data  
10 input/output field. As a result, the control name of  
the input/output field becomes the same as the control  
name of the output field. Therefore, a specific  
character string is added to the control name of the  
output field to modify the control name of the output  
15 field to "NAME-TITLE". In this way, the control name  
of the output field and the control name of the  
input/output field which is specified based on the  
field character string of the output field can be  
specified differently.

20 Similarly, "ADDRESS-TITLE" is set as the control  
name of an output field which exists closest to the  
input/output field in such a way the control name of  
the address input/output field and the control name  
of an output field immediately before the input  
25 /output field are specified differently, and

"ADDRESS1" is set as the control name of the upper address input /output field following the control name. The reason why the control name of the upper address input/output field is specified "ADDRESS1" is  
5 as follows.

When the control name candidate of a lower address input/output field is determined, "ADDRESS", which is the field character string of an output field existing closest to the input/output field, is  
10 selected. As a result, since the name candidate is already registered in the control name table 21 as the control name of the upper input/output field, the control name of the lower input/output field becomes the same as the control name of the upper input/output  
15 field. Therefore, to prevent double naming of the control names, "1" is added to the to the control name of the upper address input/output field to modify the control name of the upper address input/output field to "ADDRESS1". "2" is added to the control name candidate of the lower input/output field to set "ADDRESS2" as the control name. Similarly, control names are automatically set in the output and  
20 input/output fields of phone number and birthday.

Fig. 17 shows the case where a program for  
25 realizing the generation function of the GUI screen

of the above-described GUI screen generation unit 15  
is stored in a portable storage medium 41, such as a  
CD-ROM, floppy disk, etc., or in a storage device 42  
possessed by a program provider and the program is  
5       executed by downloading the program to a user's  
information processing device 43.

If the GUI screen generation program is recorded  
in a portable storage medium 41, such as a CD-ROM,  
floppy disk, etc., the program is read by inserting  
10      the portable storage medium 41 in the driver unit 44  
of the information processing device 43, the program  
is executed by storing the read program in a memory  
45, such as a RAM, hard disk, etc. If the program is  
provided by a program provider via a communication  
15      line, a program stored in the storage device 42,  
memory, etc., of the program provider is received in  
the information processing device 43 via the  
communication line and the program is executed by  
storing the received program in the memory 45, such  
20      as a RAM, hard disk, etc. The program stored in the  
storage medium 41 can also be a program for realizing  
a part of the functions described in the preferred  
embodiment.

According to the above-described preferred  
25      embodiment, when a host-centered type CUI screen is

converted to a client-server type GUI screen, a name related to the output data or input data of a control can be used as the name of the control on the GUI screen. By doing so, when a program for generating a  
5 GUI screen is prepared or the program is maintained, the content of the program can be made easy to understand. Accordingly, the development time required to convert the host-centered type business CUI screen to the client-server type GUI screen can be reduced  
10 and the cost required to develop the program can also be reduced.

Although in the above-described preferred embodiment, the GUI screen generating apparatus is realized as a development tool function, the apparatus  
15 is not limited to this and can also be realized as a dedicated device. Alternatively, the apparatus can be realized as an application program executed by a personal computer, etc. A network connecting clients  
12 is not limited to a LAN and can also be a public network, dedicated line or the Internet.  
20

According to the present invention, when a CUI screen is converted to a GUI screen, for example, a name related to a control can be used as the control name of the GUI screen. Therefore, the generation of  
25 a program or the maintenance of the program can be

simplified and a host-centered type business user interface can be converted to a client-server type user interface in a shorter time.

**What is claimed is:**

1. A GUI screen generating apparatus, comprising:
  - an extraction unit extracting field information from screen data of a character-based user interface screen; and
    - a naming unit specifying a control name of a graphical user interface screen corresponding to the field information based on the field information extracted from the extraction unit.
2. The GUI screen generating apparatus according to claim 1, wherein said naming unit specifies the control name of the graphical user interface screen based on a field character string in the field information.
3. The GUI screen generating apparatus according to claim 1, wherein if the field information indicates that a field is an input/output field, said naming unit specifies a control name of the field based on a field character string of an output field in a vicinity of a field to be named.
- 25 4. The GUI screen generating apparatus according to

claim 2, wherein if the field information indicates that a field is an input/output field, said naming unit specifies a control name of the field based on a field character string of an output field in a vicinity of a field to be specified.

5. The GUI screen generating apparatus according to claim 1, wherein if the field information indicates that a field is an input/output field, said naming  
10 unit specifies a control name of the field based on a field character string of an output field which is before a field to be specified and exists closest to the field.

15 6. The GUI screen generating apparatus according to claim 4, wherein when specifying the control name based on the field character string, said naming unit adds a specific character string to a registered control name or control name to be specified in such  
20 a way that the name may not be the same as an already registered control name.

7. The GUI screen generating apparatus according to claim 5, wherein when specifying the control name  
25 based on the field character string, said naming unit

adds a specific character string to a registered control name or control name to be specified in such a way that the name may not be the same as an already registered control name.

5

8. The GUI screen generating apparatus according to claim 4, wherein said naming unit specifies a control name of a GUI screen according to a group of predetermined control name specifying regulations.

10

9. A GUI screen generating method, comprising:

extracting field information from screen data of a character-based user interface screen; and

15      specifying a control name of a graphical user interface screen corresponding to the field information based on the extracted field information.

10. A computer-readable storage medium on which is recorded a GUI screen generation program enabling a computer to extract field information from screen data of a character-based user interface screen and to specify a control name of a graphical user interface screen corresponding to the field information based on the extracted field information.

25

11. The computer-readable storage medium according to  
claim 10 on which is recorded a GUI screen generation  
program enabling a computer to specify a control name  
of the field based on a field character string of an  
output field in a vicinity of a field to be specified  
if the field information indicates that the field is  
an input/output field.

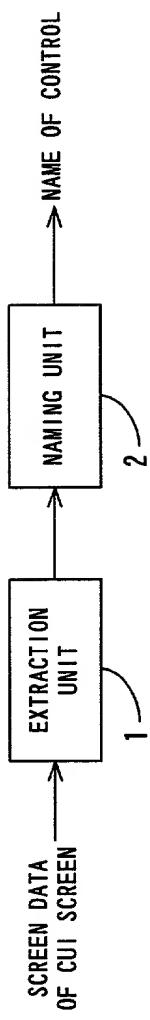
5

12. A GUI screen generating apparatus, comprising:  
10       extracting means extracting field information  
from screen data of a character-based user interface  
screen; and  
15       naming means specifying a control name of a  
graphical user interface corresponding to the field  
information based on the extracted field information  
extracted by the extraction unit.

**Abstract of the Disclosure**

Whether a field is an output field or input /output field is judged from an acquired field attribute. If the field attribute is an input/output field, the field character string of an output field which exists closest to the input/output field is selected as the control name candidate of the field. If the field attribute is an output field, the field character string of the field is selected as the control name candidate of the field. In this way, names related to the field can be assigned as control names on a GUI screen.

F I G. 1



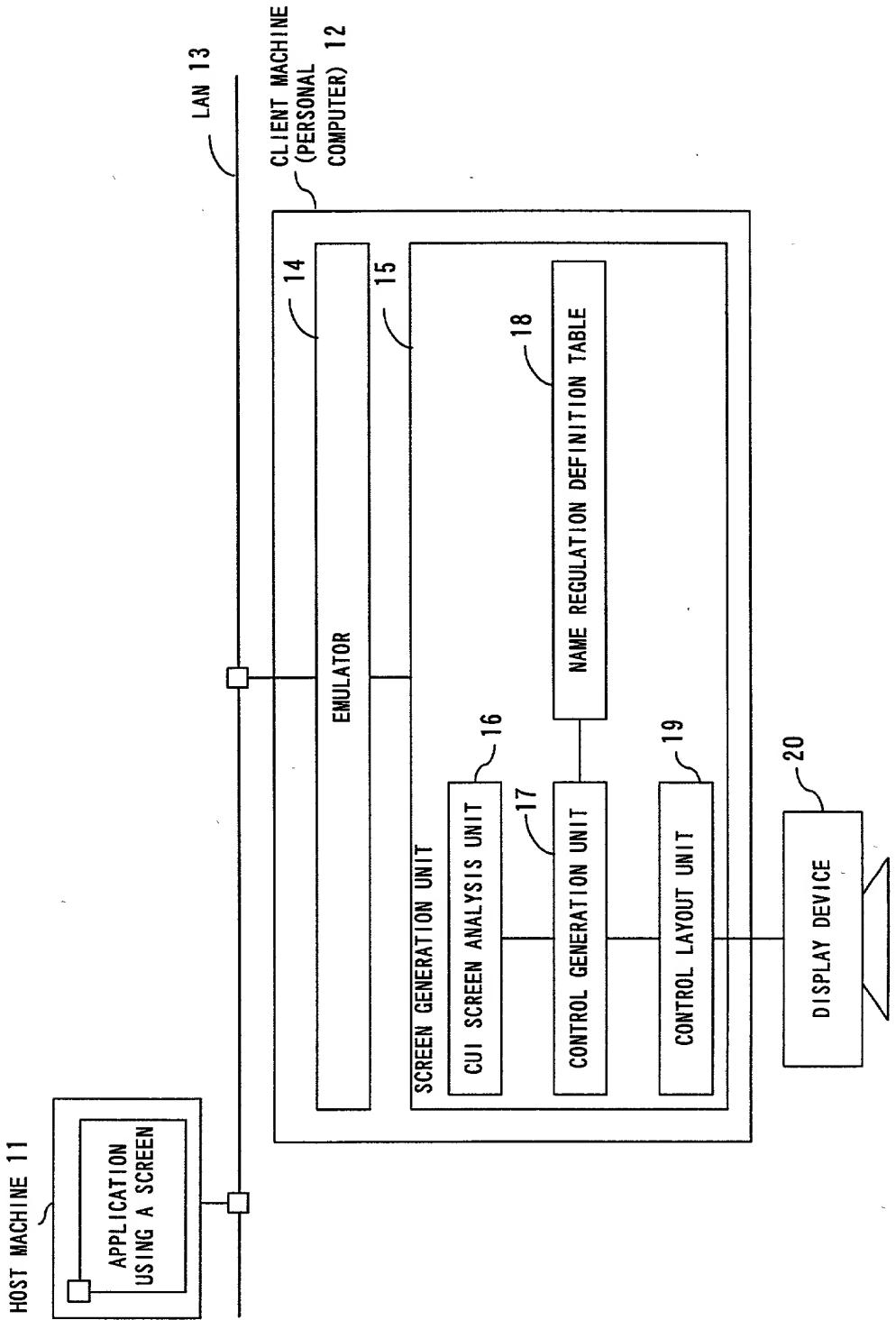


FIG. 2

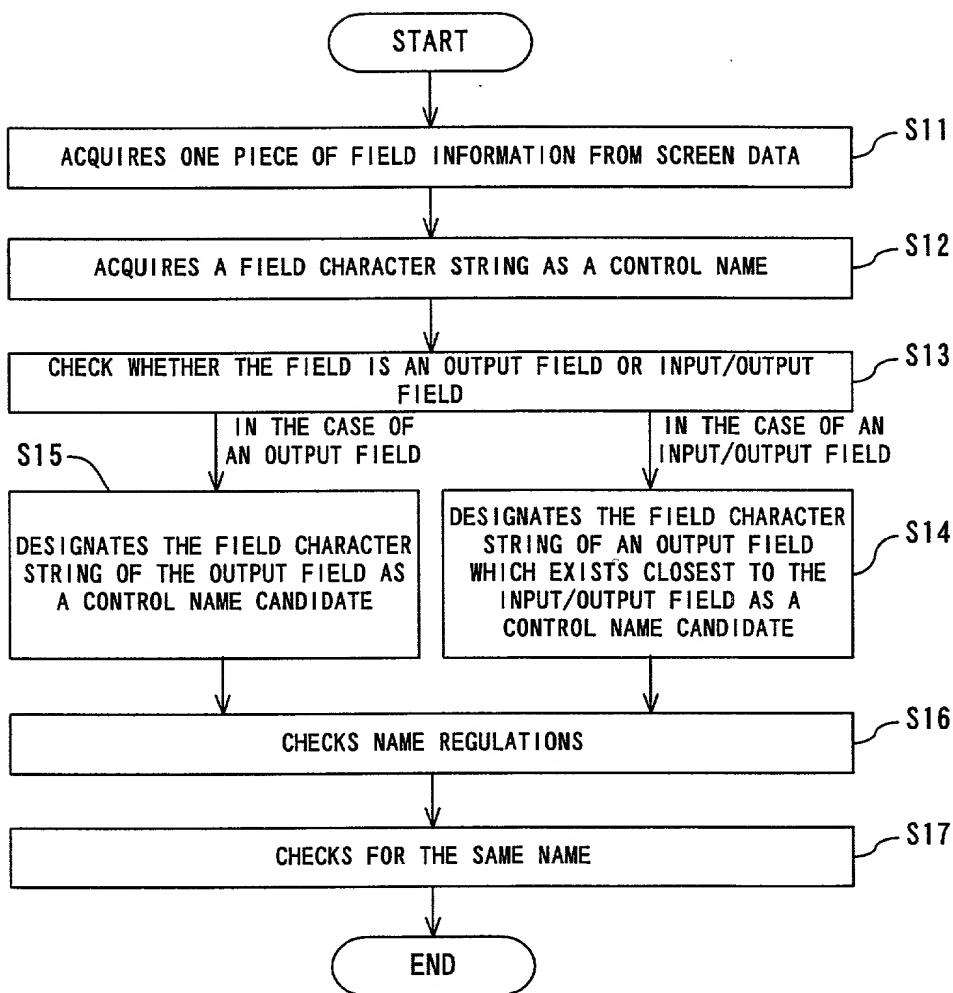


FIG. 3

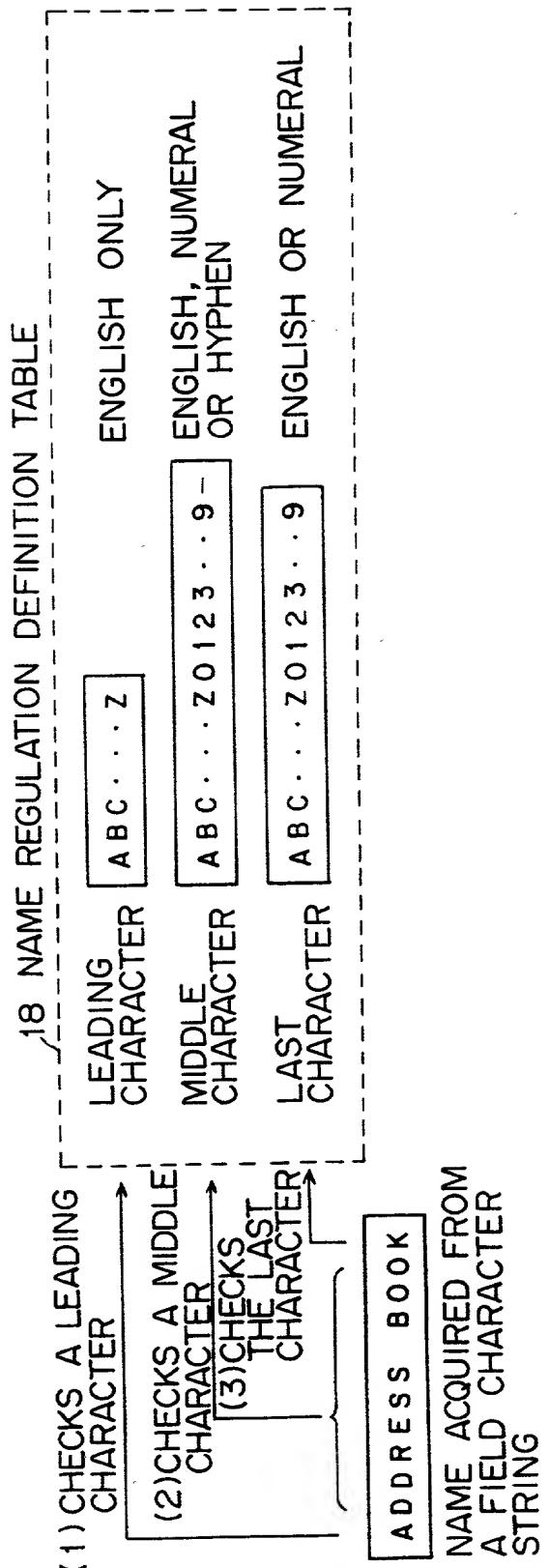
**STRUCTURE OF SCREEN DATA**

<b>FIELD INFORMATION 1</b>	<b>FIELD INFORMATION 2</b>		<b>FIELD INFORMATION n</b>
--------------------------------	--------------------------------	--	--------------------------------

**STRUCTURE OF FIELD INFORMATION**

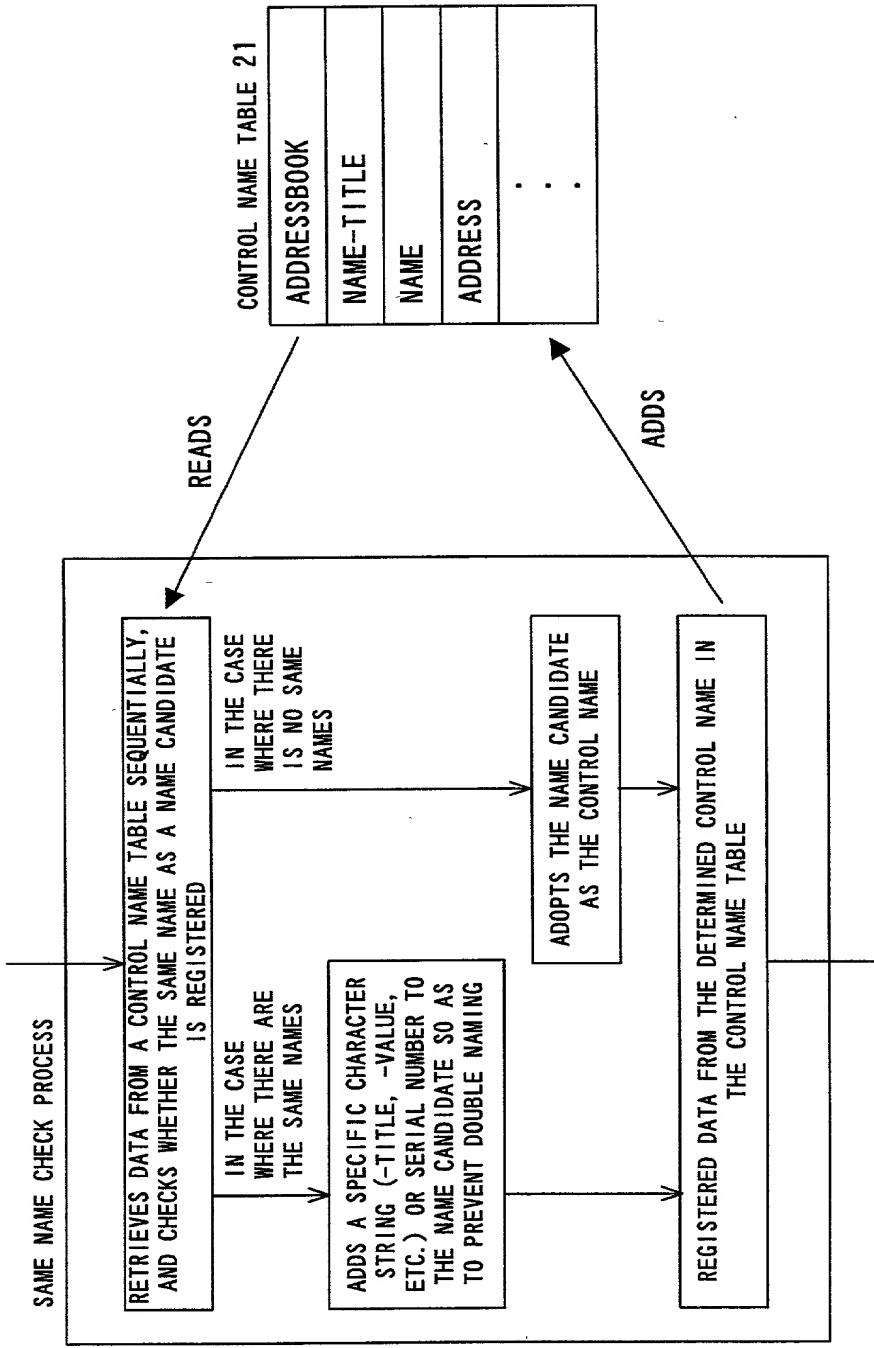
<b>FIELD ATTRIBUTE</b>	<b>FIELD CHARACTER STRING</b>
------------------------	-----------------------------------

**F I G. 4**



F | G. 5

F I G. 6



	0	1	2	3	4
	1	2	3	4	5
01	1	2	3	4	5
2	3	4	5	6	7
3	NAME	XXXXXX	XXXXXX	XXXXXX	XXXXXX
4	ADDRESS	XXXXXX	XXXXXX	XXXXXX	XXXXXX
5		XXXXXX	XXXXXX	XXXXXX	XXXXXX
6	TEL	XXXXXX	XXXXXX	XXXXXX	XXXXXX
7					
8	BIRTHDAY	99999999			
9					
10					
11					

FIG. 7

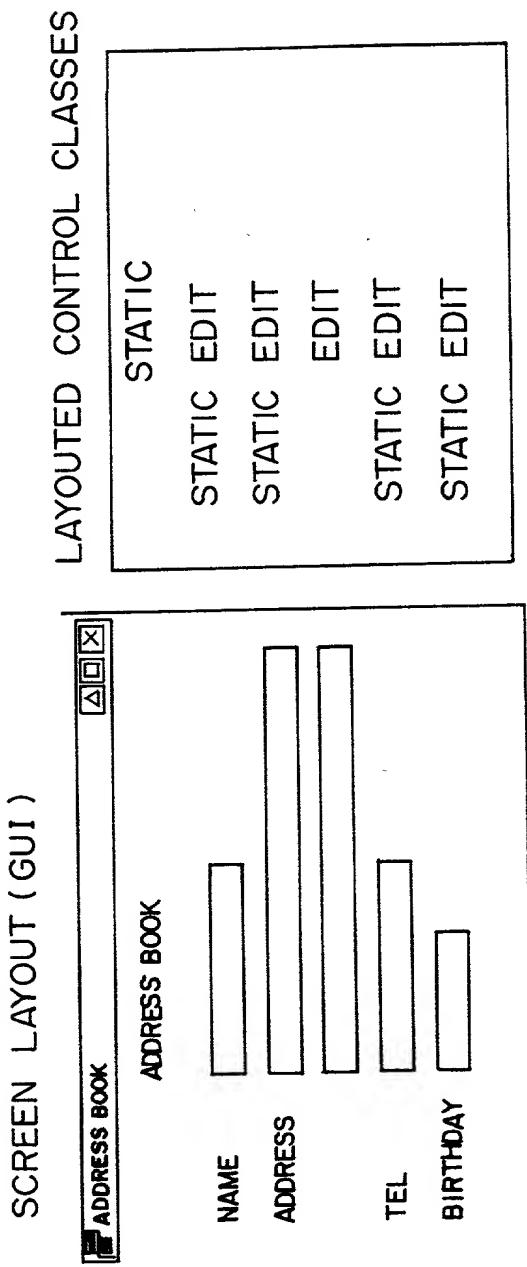


FIG. 8A  
FIG. 8B

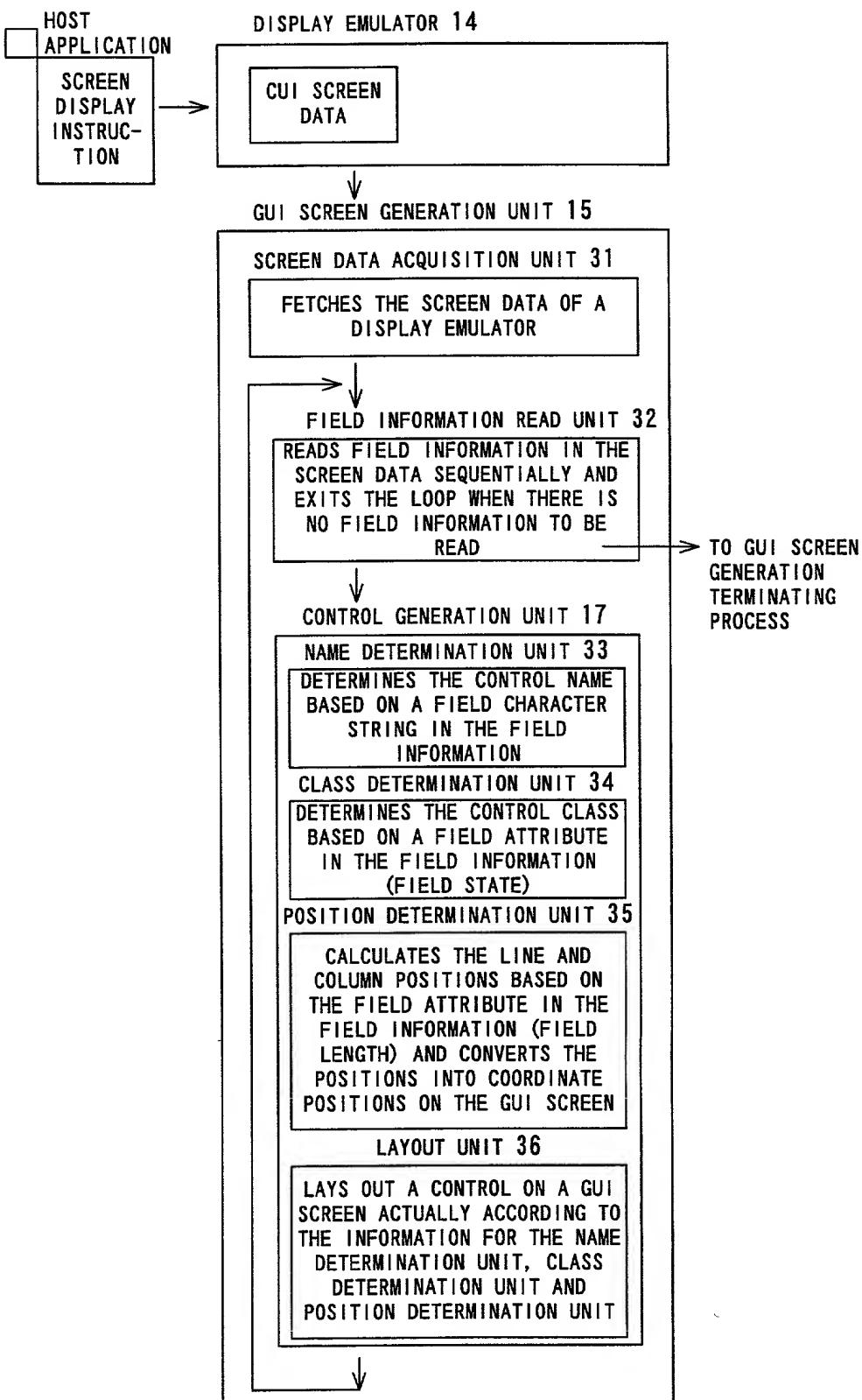


FIG. 9

F I G. 10

FIELD ATTRIBUTE						FIELD CHARACTER STRING
FIELD STATE	FIELD LENGTH	CHARACTER TYPES	COLOR OF CHARACTER	BACKGROUND COLOR		
OUTPUT	11	ENGLISH OR DIGITS	GREEN	BLACK		
FIELD INFORMATION 2	OUTPUT	12	ENGLISH OR DIGITS	YELLOW	BLACK	ADDRESS BOOK
FIELD INFORMATION 3	OUTPUT	139	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 4	OUTPUT	4	ENGLISH OR DIGITS	GREEN	BLACK	NAME
FIELD INFORMATION 5	OUTPUT	5	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 6	INPUT/OUTPUT	15	ENGLISH OR DIGITS	WHITE	BLACK	XXXXXXXXXXXX
FIELD INFORMATION 7	OUTPUT	136	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 8	OUTPUT	7	ENGLISH OR DIGITS	GREEN	BLACK	ADDRESS
FIELD INFORMATION 9	OUTPUT	2	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 10	INPUT/OUTPUT	30	ENGLISH OR DIGITS	WHITE	BLACK	XXXXXXXXXXXXXXXXXXXX
FIELD INFORMATION 11	OUTPUT	50	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 12	INPUT/OUTPUT	30	ENGLISH OR DIGITS	WHITE	BLACK	XXXXXXXXXXXXXXXXXXXX
FIELD INFORMATION 13	OUTPUT	121	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 14	OUTPUT	4	ENGLISH OR DIGITS	GREEN	BLACK	TEL
FIELD INFORMATION 15	OUTPUT	5	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 16	INPUT/OUTPUT	15	ENGLISH OR DIGITS	WHITE	BLACK	XXXXXXXXXXXX
FIELD INFORMATION 17	OUTPUT	136	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 18	OUTPUT	8	ENGLISH OR DIGITS	GREEN	BLACK	BIRTHDAY
FIELD INFORMATION 19	OUTPUT	1	ENGLISH OR DIGITS	GREEN	BLACK	
FIELD INFORMATION 20	INPUT/OUTPUT	8	DIGITS	WHITE	BLACK	99999999
FIELD INFORMATION 21	OUTPUT	143	ENGLISH OR DIGITS	GREEN	BLACK	

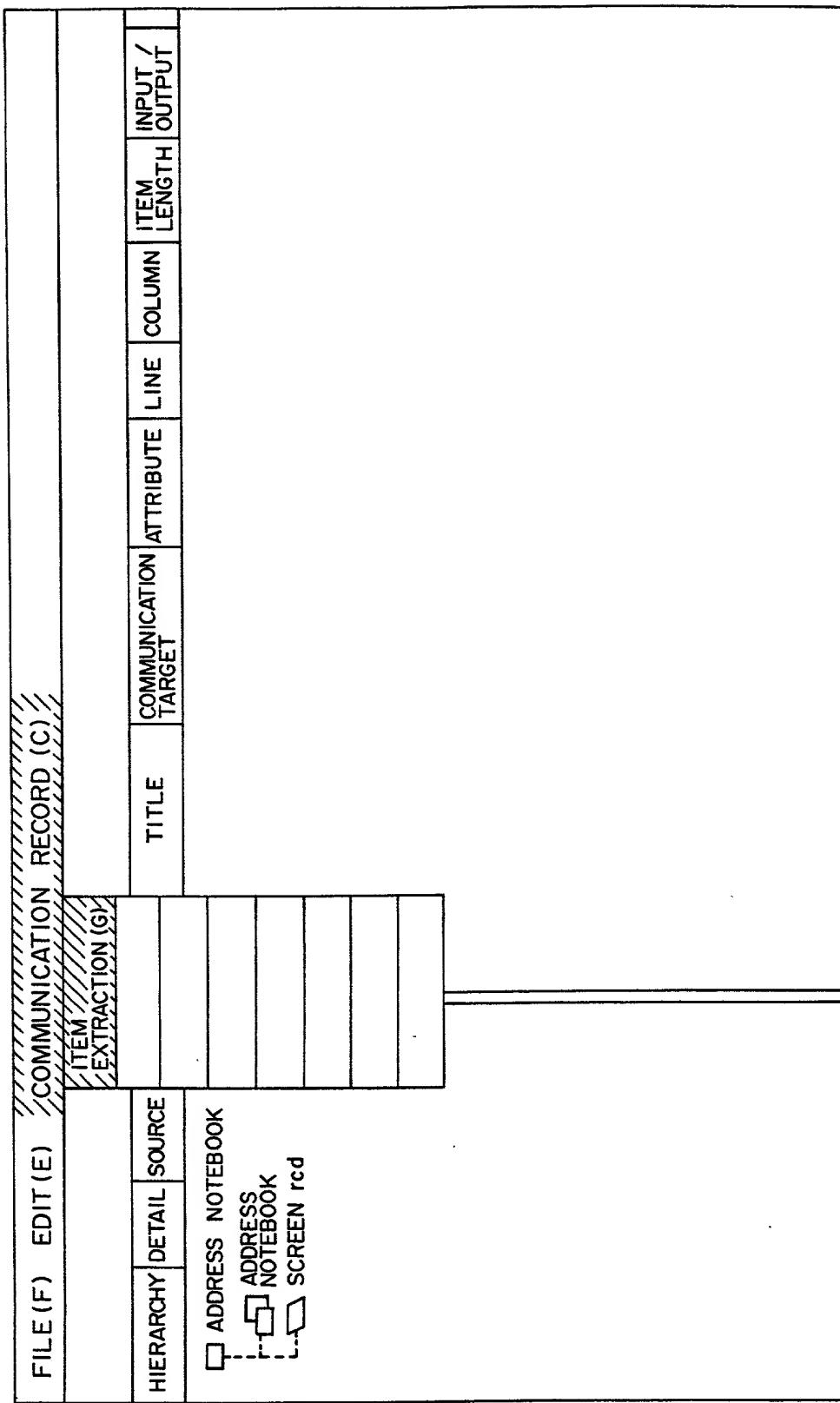
		CLASS	NAME
FIELD INFORMATION	2	STATIC	ADDRESSBOOK
FIELD INFORMATION	4	STATIC	NAME-TITLE
FIELD INFORMATION	6	EDIT	NAME
FIELD INFORMATION	8	STATIC	ADDRESS-TITLE
FIELD INFORMATION	10	EDIT	ADDRESS1
FIELD INFORMATION	12	EDIT	ADDRESS2
FIELD INFORMATION	14	STATIC	TEL-TITLE
FIELD INFORMATION	16	EDIT	TEL
FIELD INFORMATION	18	STATIC	BIRTHDAY-TITLE
FIELD INFORMATION	20	EDIT	BIRTHDAY

FIG. 11

FILE (F) EDIT (E) DISPLAY (V)	
ADDRESS BOOK	
NAME	XXXXXXXXXXXX
ADDRESS	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
TEL	XXXXXXXXXXXX
BIRTHDAY	9999999

FIG. 12

F | G. 13



FILE (F) EDIT (E) COMMUNICATION RECORD (C)		
HIERARCHY	DETAIL	SOURCE
ADDRESS BOOK	ITEM 1	TITLE
ADDRESS BOOK	ADDRESS BOOK	COMMUNICATION TARGET
SCREEN rcd	ITEM 2	ATTRIBUTE LINE
	ITEM 3	COLUMN
	ITEM 4	ITEM LENGTH
	NAME-TITLE	INPUT / OUTPUT
	ITEM 5	
	NAME	
	ITEM 6	
	ITEM 7	
	ADDRESS-TITLE	
	ADDRESS 1	
	ITEM 10	
	ADDRESS 2	
	ITEM 12	

FIG. 14

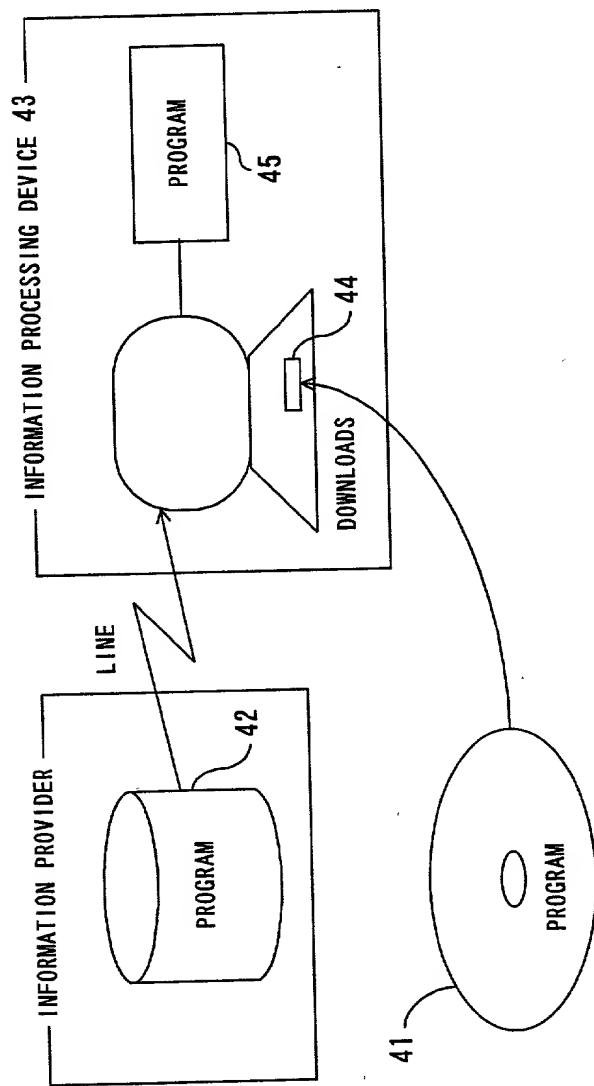
FIG. 15

FILE (F)		EDIT (E)		COMMUNICATION RECORD (C)						
HIERARCHY	DETAIL	SOURCE		TITLE	COMMUNICATION TARGET	ATTRIBUTE	LINE	COLUMN	ITEM LENGTH	INPUT / OUTPUT
<input type="checkbox"/> ADDRESS BOOK				ITEM 1			1	2	9	OUTPUT
	<input type="checkbox"/> ADDRESS BOOK scp			ADDRESS BOOK			1	12	12	OUTPUT
		<input type="checkbox"/> SCREEN rcd		ITEM 3			1	25	137	OUTPUT
			<input type="checkbox"/> SCREEN GENERATION (F)	NAME-TITLE			3	3	4	OUTPUT
				ITEM 5			3	8	3	OUTPUT
				6 NAME	✓	✓	3	12	15	INPUT / OUTPUT
				7 ITEM 7			3	28	134	OUTPUT
				8 ADDRESS-TITLE			5	3	7	OUTPUT
				9 ADDRESS 1	✓	✓	5	12	30	INPUT / OUTPUT
				10 ITEM 10			5	43	48	OUTPUT
				11 ADDRESS 2	✓	✓	6	12	30	INPUT / OUTPUT
				12 ITEM 12			6	43	119	OUTPUT

FILE (F)	CONTROL	EDIT (E)	DISPLAY (V)
<input type="checkbox"/> SCREEN	<input checked="" type="checkbox"/> <input type="checkbox"/> <b>ADDRESS BOOK</b>		
	NAME	ADDRESS	TEL
	<input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/>
	ADDRESS	ADDRESS1	TEL-TITLE
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	TEL	ADDRESS2	BIRTHDAY-TITLE
	<input type="text"/>	<input type="text"/>	<input type="text"/>
	BIRTHDAY		BIRTHDAY
	<input type="text"/>		<input type="text"/>
<b>LIST OF CONTROLS</b> <input type="checkbox"/> ADDRESS NOTEBOOK			
<input type="checkbox"/> SCREEN			
<input type="checkbox"/> ADDRESSBOOK			
<input type="checkbox"/> NAME-TITLE			
<input type="checkbox"/> NAME			
<input type="checkbox"/> ADDRESS-TITLE			
<input type="checkbox"/> ADDRESS1			
<input type="checkbox"/> ADDRESS2			
<input type="checkbox"/> TEL-TITLE			
<input type="checkbox"/> TEL			
<input type="checkbox"/> BIRTHDAY-TITLE			
<input type="checkbox"/> BIRTHDAY			

FIG. 16

F I G. 17



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**Declaration and Power of Attorney For Patent Application****特許出願宣言書及び委任状****Japanese Language Declaration****日本語宣言書**

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole Inventor (if only one name is listed below) or an original, first and joint Inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

GUI SCREEN GENERATING APPARATUS, GUI SCREEN GENERATING METHOD AND STORAGE MEDIUM RECORDING GUI SCREEN GENERATING PROGRAM

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

- \_\_\_\_月\_\_\_\_日に提出され、米国出願番号または特許協定条約国際出願番号を\_\_\_\_\_とし、  
(該当する場合) \_\_\_\_\_に訂正されました。

was filed on \_\_\_\_\_  
as United States Application Number or  
PCT International Application Number  
\_\_\_\_\_ and was amended on  
\_\_\_\_\_ (if applicable).

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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

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**Prior Foreign Application(s)**

外國での先行出願	Japan
11-219582	
(Number) (番号)	(Country) (国名)
_____	_____
(Number) (番号)	(Country) (国名)
_____	_____

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(Application No.) (出願番号)	(Filing Date) (出願日)
_____	_____

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(Application No.) (出願番号)	(Filing Date) (出願日)
_____	_____

(Application No.) (出願番号)	(Filing Date) (出願日)
_____	_____

私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行なえば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby claim foreign priority under Title 35, United States Code, Section 119(a)(d) or 365(b) of any foreign application(s) for patent or Inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or Inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

**Priority Not Claimed**

優先権主張なし

3rd/August/1999

(Day/Month/Year Filed)

(出願年月日)

(Day/Month/Year Filed)

(出願年月日)

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)
_____	_____

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
_____

(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)

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